MAJOR HURDLES TO IMPROVING PRODUCTIVITY OF COTTON

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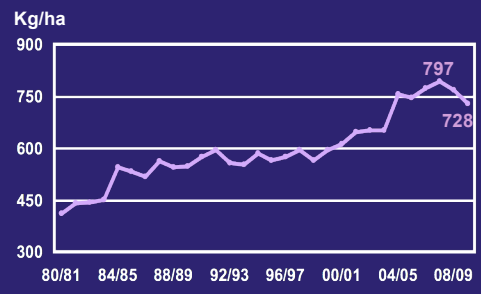
COTTON YIELDS - WORLD



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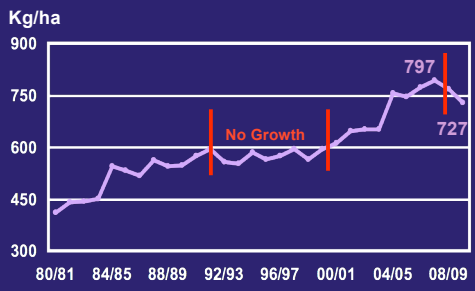
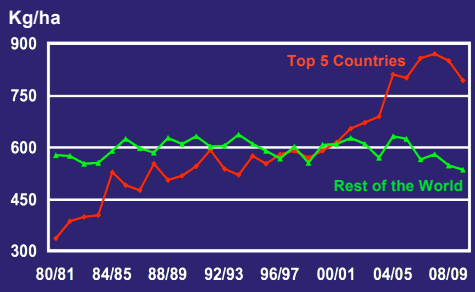


COTTON YIELDS - WORLD

- World yields are in a period of NO or SLOW growth
- How long the period of No or SLOW growth will last?
- What will increase yields?

LONG TERM TREND IN COTTON YIELDS



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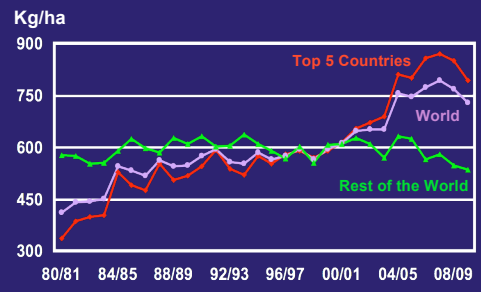
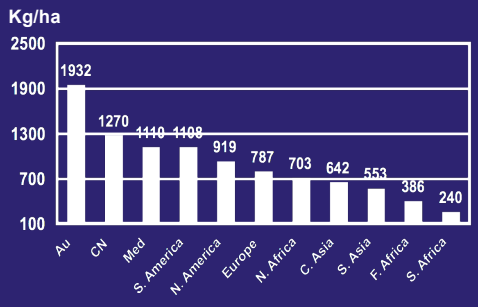


COTTON YIELDS 07/08 - Regional Differences



COTTON YIELDS - Reasons for Regional Differences

- Level of production technology/research
- Production conditions - favorable and less favorable
- Production systems - input supply
- Adoption of technology - weak extension

COTTON YIELDS - Reasons for Inter Country Differences

Same

COTTON YIELDS - Reasons for Intra Country Differences

Same

HURDLES FOR YIELD IMPROVEMENT

- Pest damage - some loss is there even under perfect pest control
- Natural shedding
- Picking losses
- Ginning losses

HIGH END YIELD IMPROVEMENT HURDLES

- Imbalance between auxin and anti-auxin hormones
- Imbalance between fruiting forms and carbohydrate supply
- C_3 nature - photorespiration
  - Higher light intensity
  - Low CO_2

HIGH END YIELD IMPROVEMENT SOLUTIONS

- Eliminate photorespiration, convert cotton into C_4 (Problem: Same enzyme that catalyzes photorespiration involved in CHO fixation)
- Maintain balance between auxin and anti-auxin hormones
- No picking and ginning losses

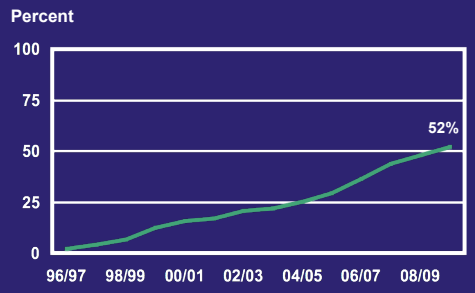
HIGH END YIELD IMPROVEMENT SOLUTIONS

- Methanol application
  - Increased CO_2 assimilation
  - Increase leaf conductance
  - Results controversial

HIGH END YIELD IMPROVEMENT SOLUTIONS

- CO_2 enrichment
  - Increased biomass - vegetative and yields
  - Increased water use efficiency
  - Increased root growth
  - Controversial results

BIOTECH COTTON AREA - WORLD



BIOTECH COTTON - 2008/09

Area	= 48%
Production	= 54%
Trade	= 52%

BIOTECH COTTON AND YIELD IMPROVEMENT

- As such NO, but through better crop protection YES
- Future approaches
  - Improve photosynthetic rate
  - Chloroplast efficiency - higher expression
  - Delaying leaf senescence (Loss of cell's power to divide and grow)

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